

ONTARIO MINISTRY OF ENVIRONMENT



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1971

OPERATING

SUMMARY

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TD
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.A56
C39
1971
MOE

CAYUGA

11

WATER POLLUTION CONTROL PLANT

**TD
367
.A56
C39
1971**

Cayuga : water pollution control
plant.

81480

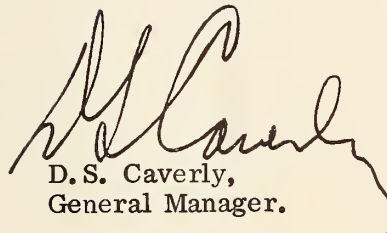


Water management in Ontario

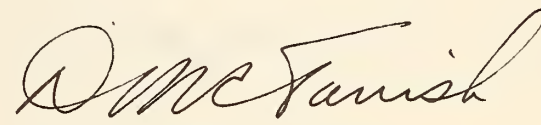
Ontario
Water Resources
Commission

We are pleased to submit for your consideration a summary of operation during 1971 of the water pollution control plant serving your community.

This operating summary contains parameters normally used to measure plant performance and loading, as well as relevant cost data. Because of the concern over eutrophication of our lakes and of the requirement, in many parts of Ontario, to remove the major contributing factor, results of analysis for phosphorus appear in this summary.



D.S. Caverly,
General Manager.



D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.



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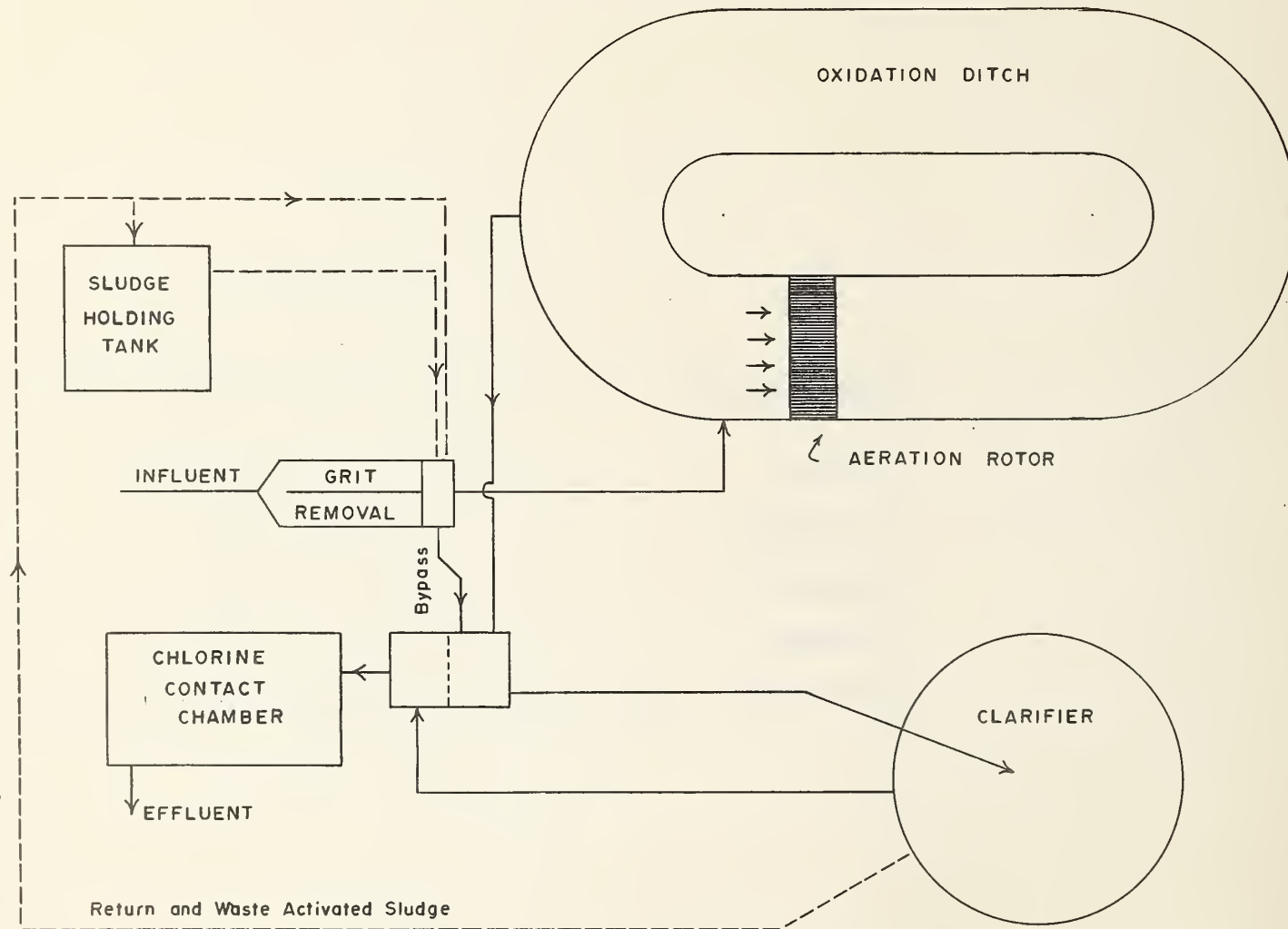
CAYUGA
WATER POLLUTION CONTROL PLANT

1971 ANNUAL OPERATING SUMMARY

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CAYUGA WPCP
FLOW CHART



DESIGN DATA

DESIGN FLOW

200,000 gpd

GRIT REMOVAL

Type: Manually cleaned channels
Size: Two 18'6" x 1'6" x 2'6" deep

AERATION TANK

Type: Oxidation ditch with one Pumps
& Softeners Ltd. rotor
Size: 23,400 cu. ft. or 146,000 gal.
Detention: 65 hr
Flow Velocity: 1 fps (min)

FINAL CLARIFIER

Type: Dorr-Oliver
Size: One 24' dia x 12' swd
(33,800 gal) overflow rate
at design capacity 440 gal/
ft²/day

CHLORINATION

Type: Gas
Size: 50 lb/day

CONTACT TANK

Size: 4750 gal
Detention: 34 min.

'71 Review

GENERAL

The Cayuga Water Pollution Control Plant is a 0.20 MGD oxidation ditch utilizing the extended aeration process. The sewage treatment plant consists of screening facilities, grit channel, oxidation ditch, final settling, chlorination, and sludge holding facilities. There is a remote pumping station and sewer system associated with this project. The plant and sewer system are operated by a part-time operator for the Village of Cayuga.

Construction of the water pollution control facilities for the Village of Cayuga was completed only in 1971. Treated sewage flows were first recorded during June 1971.

Under the supervision of head office engineers, the staff operated a clean, attractive and efficient plant for the Village of Cayuga.

EXPENDITURES

The total operating cost for the year was \$9,081.03 or \$799.56 per million gallons of sewage treated. The unit cost of treating one pound of BOD was 74 cents. These unit costs should be interpreted considering that sewer connections were being made throughout the year. At the time of plant start-up, very little flow was being received at the plant.

PLANT FLOWS and CHLORINATION

The total raw sewage flow treated for the seven months of operation was 11.37 million gallons. This represented an average daily flow of 0.057 million gallons or 28.5 percent of the plants design capacity of 0.20 mgd.

An average chlorine dosage of 15.1 mg/l was required to maintain an average chlorine residual in the final effluent of 0.5 mg/l.

AERATION

The average MLSS concentration of 3400 mg/l and F/M ratio of 0.03 are within the accepted limits.

PLANT EFFICIENCY

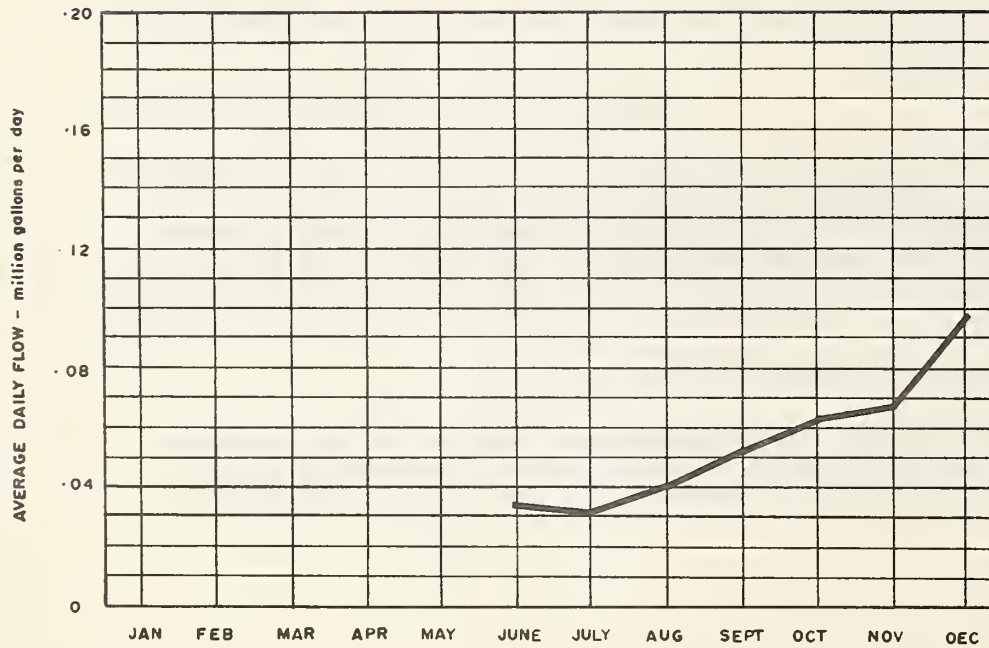
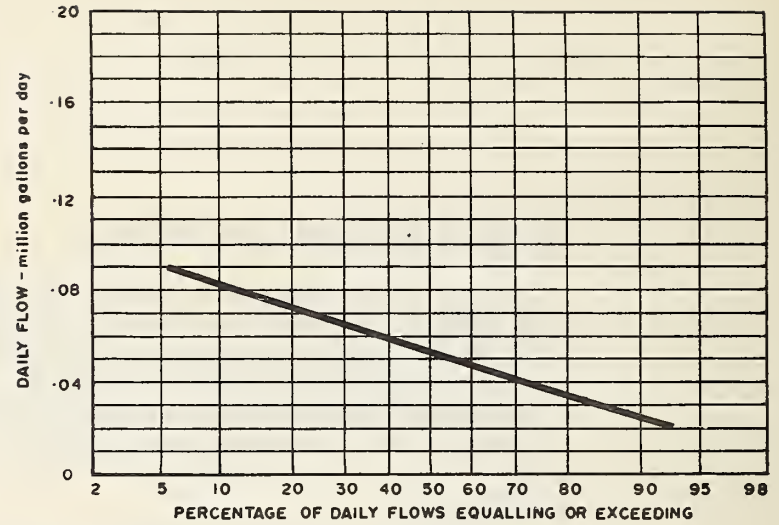
The average BOD and suspended solids concentrations in the influent were 110 mg/l and 80 mg/l respectively. The effluent BOD and suspended solids concentrations of 3 mg/l and 8 mg/l respectively were well below the OWRC objective of 15 mg/l for each. Removal efficiencies for BOD and suspended solids were 97 and 93 percent respectively.

CONCLUSIONS

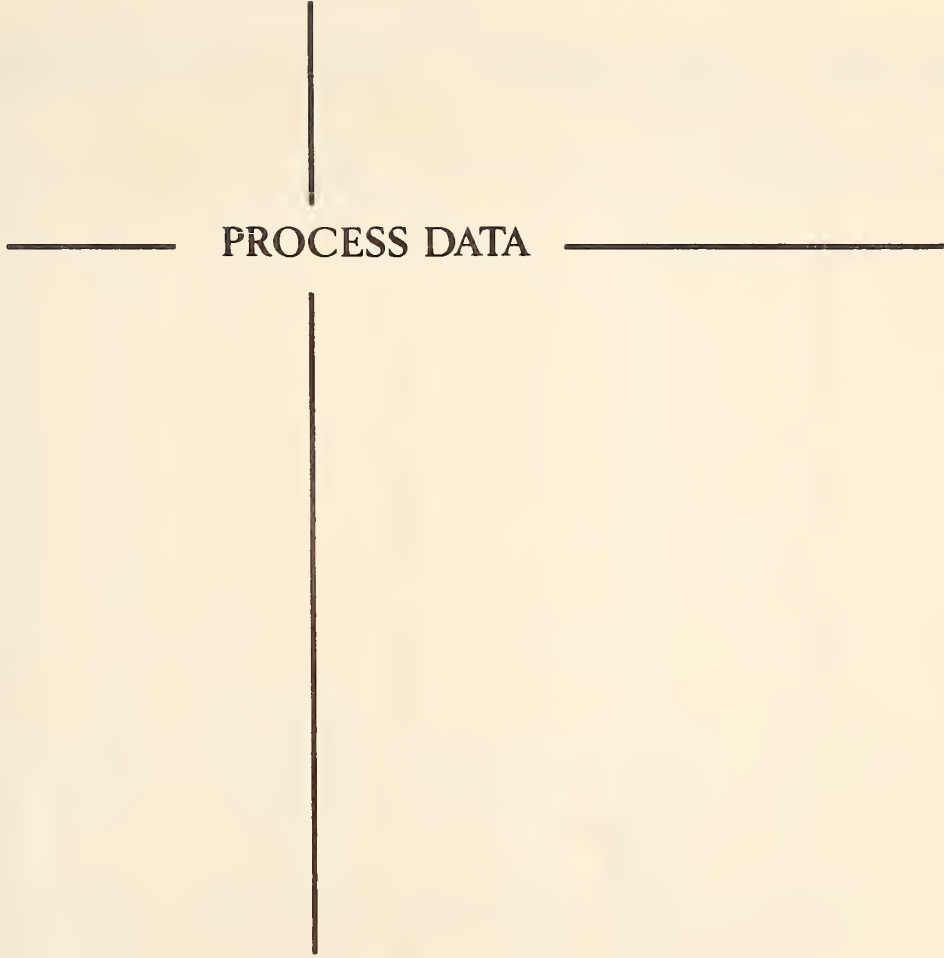
The plant produced an excellent effluent throughout the year.

Low influent BOD and suspended solids concentrations indicate that an excessive volume of storm water is gaining access to the sewer system. The Village should ensure that roof leaders are removed from discharge to the sanitary sewer system.

FLOWS



DESIGN CAPACITY -----



PROCESS DATA

PLANT PERFORMANCE

MONTH	FLOWS				BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				TOTAL PHOSPHORUS		
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	MAXIMUM RATE	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION
	million gallons	mil gal	mil gal	mgd	mg/l	mg/l	%	10 ³ pounds	mg/l	mg/l	%	10 ³ pounds	mg/l as P	mg/l as P	%
JAN															
FEB															
MAR															
APR															
MAY															
JUNE	.553 a	.033	.041												
JULY	.965	.031	.043												
AUG	1.228	.040	.074			1				15				6.0	
SEPT	1.570	.052	.087												
OCT	1.996	.063	.089		140	2	99	2.7	100	5	95	1.9	12.0	4.5	63
NOV	2.066	.069	.108		80	4	95	1.6	60	5	92	1.1	.8	4.5	0
DEC	3.022	.097	.162												
TOTAL	11.370 b	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AVG.	-	.057	MAXIMUM .162	MAXIMUM -	110	3	97	2.1	80	8	93	1.5	6.4	5.0	22
No. of Samples	-	-	-	-	2	3	-	-	2	3	-	-	2	3	-

a - 17 days' flow

b - 210 days' flow

TREATMENT DATA

MONTH	GRIT	CHLORINATION		AERATION			WASTE SLUDGE			AEROBIC DIGESTER			
	QUANTITY REMOVED	CL ₂ USED	AVG. DOSAGE	MLSS. CONC	F/M	AIR USED	QUANTITY	SUSPENDED SOLIDS	VOL. SOLIDS	QUANTITY REMOVED	SUSPENDED SOLIDS	VOL. SOLIDS	AMOUNT HAULED
	cubic feet	pounds	mg/l	mg/l	day ⁻¹	$\frac{1000 \text{ ft}}{\text{lb BOD}}$	10 gallons	mg/l	%	10 gallons	mg/l	%	cubic yards
JAN													
FEB													
MAR													
APR													
MAY													
JUNE	5.7	163	29.5										
JULY	8.2	142	14.7										
AUG	6.2	220	17.9	3800									
SEPT	6.0	300	19.1	-									
OCT.	6.4	304	15.5	1090	.04								
NOV	6.9	310	15.0	5340	.01								
DEC	4.7	278	10.0	-	-								
TOTAL	44.1	1717	-	-	-	-		-	-		-	-	
AVG.	$\frac{4}{\text{cu. ft/mil gal}}$	245	15.1	3410	.03								

Date Due

APR 6 1977

ONTARIO WATER RESOURCES COMMISSION
DIVISION OF PLANT OPERATIONS.
TD 227/C39/W38/1971/MOE
1971 OPERATING SUMMARY
CAYUGA WATER POLLUTION
CONTROL PLANT.

DATE	ISSUED TO
23.3.73	C.I. MR. Derrick

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